



# Educating Aging Drivers about New Traffic Control Devices: A Human Factors Checklist and Dissemination Plan



## Abstract

When designing educational materials for public dissemination, many factors are important to ensure that the intended message reaches the target audience, especially when the message concerns public safety on our roadways. In support of various programs concerned with safe mobility for life over the past few years, the Florida Department of Transportation (FDOT) has developed and distributed several empirically validated tip cards to assist Florida road users with commonly reported confusions as well as for newly implemented traffic control devices. The specific aim was to support aging road users, given their greater vulnerability in traffic crashes.

In this study, we developed empirically supported guidelines in the form of a human factors checklist and templates for the design of tip cards and other public service transportation materials. We reviewed a variety of literatures on how to design effective tip cards for older adults and adopted a framework for effective communication of information. We reviewed processes pertaining to attention, encoding, comprehension, attitudes, and motivation. The literature identified age differences in some of these processes and suggested best practices for design and layout of materials containing text and pictorial information. To assist with the implementation of the research findings, we created a simple human factors checklist to establish design templates in various formats. This checklist included recommendations based on legibility, pictorial materials, layout, comprehension and memory, attitudes, and motivation.

We recommended using the human factors checklist and templates to guide design of future tip cards and to modify current tip card designs for redistribution. We recommended further study of the relative effectiveness of photos versus 3-D images in educational materials distributed to aging road users. Using the results and recommendations, the Florida Department of Transportation used the checklist and general guidelines to create new tip cards for roundabouts, flashing yellow arrow, and right turn on red. They also developed an implementation plan that includes helping others learn how to develop educational materials to benefit aging road users.

### Attention Processes

Capture and maintain attention using high salient features such as color, shape, symbol type, movement

### Encoding Processes

Legibility factors such as font characteristics (size, type, and color), luminance, and contrast

Text vs. pictures

### Comprehension Processes

Knowledge factors such as reading level (Flesch), working memory capacity

Psycholinguistic factors such as syntax, semantics, that effect ease of building a situation model

### Attitudinal Processes

Trust in message source  
Education vs persuasion  
Gain vs loss framing

### Motivational Processes

Promoting adherence

## Checklist

### Checklist for Design of Tip Cards and Brochures for Aging Road Users



Through the years, FDOT has developed and used educational tip cards in many safety programs and campaigns. To ensure that the materials being developed provide aging road users with the information needed to safely respond to traffic control devices, our Safe Mobility for Life Program worked with FSU, Department of Psychology and the School of Communications on a human factors research project. This project allowed us the opportunity to study younger, middle, and older adults on the use and benefit of educational tip cards. This research-based checklist will assist in the design of future educational materials to benefit aging road users.

#### GUIDELINES

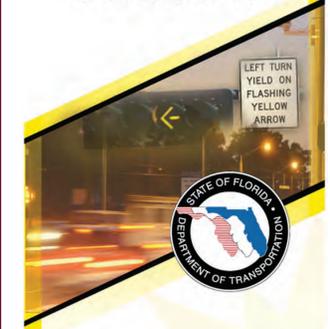
FACTOR	ADVICE
LEGIBILITY	<input type="checkbox"/> Font size minimum of 12-14 point x-height
	<input type="checkbox"/> Serif font if large, otherwise sans-serif
	<input type="checkbox"/> Prefer bolded text, particularly for headers
	<input type="checkbox"/> Avoid decorative font
	<input type="checkbox"/> Mixed case for body text except where emphasis is needed then uppercase
	<input type="checkbox"/> High enough contrast that can be read at <math><40 \text{ cd/m}^2</math>
	<input type="checkbox"/> Prefer black on white or white on black text
	<input type="checkbox"/> Consider colored text or backgrounds for emphasis but avoid blue/violet
	<input type="checkbox"/> Left-justify text for passages
	<input type="checkbox"/> Double-space text when possible
PICTORIAL MATERIALS	<input type="checkbox"/> Add pictures to text to convey complex instructions
	<input type="checkbox"/> Prefer high resolution photos to convey real-life events
	<input type="checkbox"/> Prefer high quality illustrations when conveying detailed information
	<input type="checkbox"/> Caption pictorial materials that are not easy to interpret
	<input type="checkbox"/> Try to use culturally relevant illustrations
LAYOUT	<input type="checkbox"/> Provide key information first (top)
	<input type="checkbox"/> Use bulleted lists to break up paragraphs of text
	<input type="checkbox"/> Use color to make the material attractive and engaging
	<input type="checkbox"/> Use headings and subheadings to create visible sections
	<input type="checkbox"/> Try to keep 10-35% of the page as white space to reduce clutter

Human Factors Guidelines to Develop Educational Tip Cards for Aging Road Users BDV30-977-15

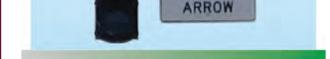


## Tip Cards

### Flashing Yellow ARROW



#### What you need to know!



**What is a flashing yellow arrow?**  
It is a new type of signal placed over a left turn lane at a signalized intersection where one of the signal indications is a flashing yellow arrow. Other signal indications shown are the green arrow, yellow arrow, and red arrow.

**Why is it a better left-turn signal?**  
Flashing yellow arrows are the result of a national study conducted by the Federal Highway Administration, which demonstrated that the new signal indication:  
- Is a low-cost safety measure to help prevent crashes.  
- Moves more traffic through an intersection.  
- Provides additional traffic management flexibility.  
- Provides a clear distinction between when motorists who are turning left are protected from oncoming traffic and when they must yield.

- How do they work?**
- Red arrow means STOP and remain stopped. No left turns allowed.
  - Yellow arrow means prepare to stop or complete your left turn if you are in an intersection.
  - Flashing yellow arrow means left turns allowed. Yield to oncoming traffic and pedestrians. The oncoming traffic has green light.
  - Green arrow means GO. It is safe to turn left; oncoming traffic must stop.

**Where will these signals be installed?**  
FDOT will be installing flashing yellow arrow signals at various locations throughout the state on a case by case basis. We will complete full evaluations prior to statewide implementation.  
For more information, visit our Web Site at: [www.dot.state.fl.us/trafficoperations/](http://www.dot.state.fl.us/trafficoperations/)

#### What is a flashing yellow arrow?

**A new traffic signal that means you can turn left if there is a safe gap in traffic**

SEE THIS	DO THIS
	Turn left.
	Prepare to stop or complete your left turn.
	Turn left provided there is a safe gap in vehicle and pedestrian traffic.
	Stop.

For more information, visit: [FLsams.org](http://FLsams.org)

CONTROL

CHECKLIST

**FDOT**  
Florida Department of Transportation

Prepared in cooperation with the State of Florida Department of Transportation and the U.S. Department of Transportation.  
Project ID: BDV30 977-15

